

Hardware Assignment

AI1110: Probability and Random Variables
Indian Institute of Technology Hyderabad

CS22BTECH11061

Waghmare Aditya Abhaykumar

Abstract—In this assignment we have made a Random number generator using shift registers

COMPONENTS USED

Component	Value	Quantity
Breadboard		1
Seven Segment Display	Common Anode	1
Decoder	7447	1
Flip Flop	7474	2
X-OR Gate	7486	1
555 IC		1
Resistor	1 K Ω	1
Capacitor	100 nF	1
Capacitor	10 nF	1
Jumper Wires		

TABLE 0
COMPONENTS USED

PROCEDURE

- 1) First we connect the 555 timer circuit according to the figure 1

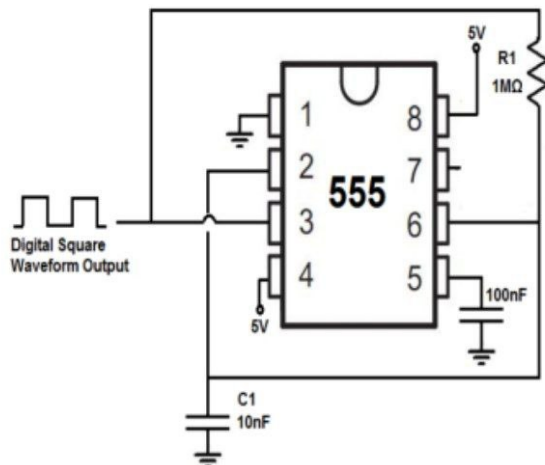


Fig. 1. Connection in 555 timer circuit

- 2) Then we connect Clock output of 555 timer circuit to the clock signal of D-Flip flops
- 3) Now we make the circuit for shift registers using 4 D-Flip flops (using two 7474 IC's)

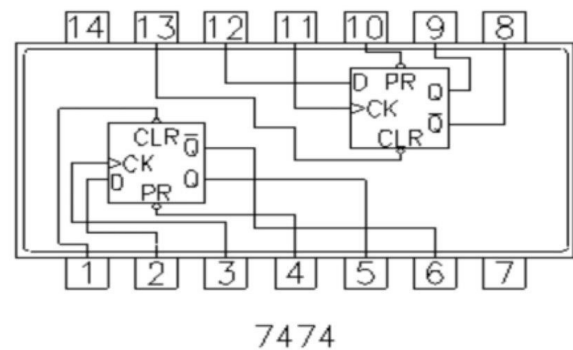


Fig. 3. Connection in 7474 IC

- 4) Then we connect XOR gate (7486 IC) according to the figure 4

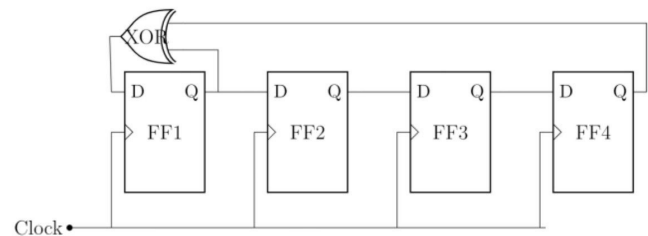


Fig. 4. Connection in XOR gate

- 5) After that we connected the decoder (7447 IC) and connected its A,B,C,D with Q_0, Q_1, Q_2, Q_3 respectively as per the figure 5
- 6) Then we place The seven segmented display and connect it with the dceoder (7447 IC) according to the table 6 and the figure 6
- 7) We connect all the independent parts with each other and connect it to the power source



Fig. 5. Connection in Decoder gate

7447	\bar{a}	\bar{b}	\bar{c}	\bar{d}	\bar{e}	\bar{f}	\bar{g}
Display	a	b	c	d	e	f	g

Fig. 6. Connection of seven segmented display with decoder

- 8) Output was changing digits on the seven segment display the output is shown in figure 8

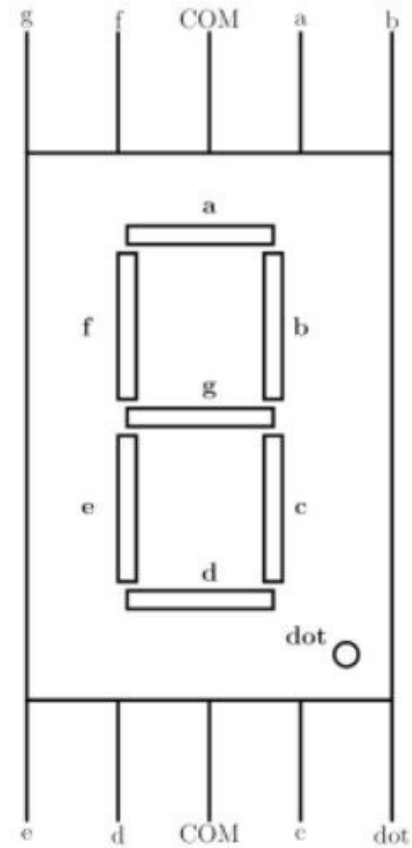


Fig. 6. Seven segmented display

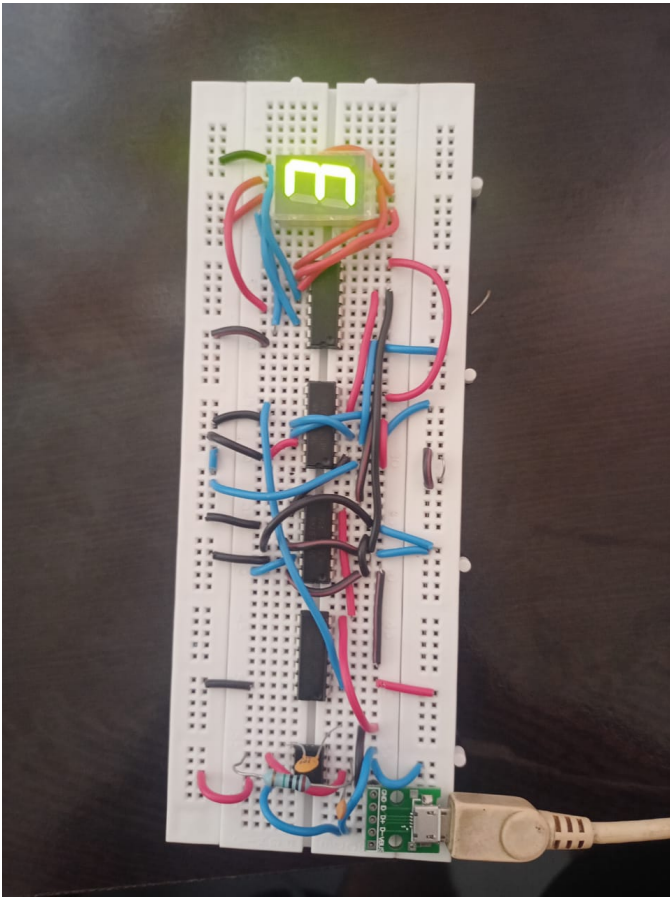


Fig. 8. output